

9. (New) A drive unit as in claim 1 wherein said rotor is fixed against rotation with respect to said drive shaft.

REMARKS

Claim 4 has been amended to address the rejection under 35 U.S.C. §112, second paragraph. Basis for the amendment is found in the specification at page 11, lines 17-21.

Claim 1 has been amended to limit the drive unit to a stator/rotor mounted to the housing/crankshaft of an internal combustion engine.

Claims 1-2 and 4 stand rejected under 35 U.S.C. §102 as anticipated by Laing GB 2,182,808. To the extent that this rejection would be applied to claims as presently amended, it is traversed for the reasons following.

GB '808 discloses an electric motor for driving a pump, wherein an external stator has a spherical surface which faces a spherical surface of an internal rotor connected to a pump impeller. The spherical shape of the surfaces is intended to eliminate axial forces present between the rotor and the stator, which forces stress the bearings which support the rotor with respect to the stator.

GB '808 only discloses a rotor which is fixed to the impeller of a pump, and does not suggest that the spherical surfaces would serve any purpose in the environment of an internal combustion engine. The crankshaft of an internal combustion engine is subjected to axial forces which are independent of the rotor and stator, these forces being taken up by thrust bearings which typically bear on axial surfaces of the crankshaft.

GB '808 does not suggest any reason to provide mutually facing spherical surfaces on a rotor and stator in an internal combustion engine wherein the rotor is fixed to the crankshaft.

GB '808 relates exclusively to spherical surfaces and teaches away from the conical surfaces recited in claim 4.

Claims 1-2 and 4 also stand rejected under 35 U.S.C. §102 as being anticipated by Laing U.S. 3,723,029. To the extent that this rejection would be applied to claims as presently amended, it is traversed for the reasons following.

Laing '029 relates strictly to a cooling water pump having a belt driven shaft which carries a driving magnet pole ring 7 with a hemispherical surface, and an impeller having a driven magnetic pole ring with a hemispherical surface. The spacing of the hemispherical surfaces determines the degree of slip between the pole rings, the pump being designed for higher slip at higher rotational speeds in order to minimize power losses to the pump.

Laing '029 does not suggest any reason to mount either of the pole rings to a crankshaft. The shaft 5 is provided with a pulley 6 engaged by a belt. Like GB '808, the spherical surfaces are provided to counterbalance axial magnetic forces, which are not a problem with a crankshaft. Laing '029 relates exclusively to spherical surfaces and teaches away from the conical surfaces recited in claim 4.

Further, while the pole ring of the impeller is "conceived to act as an inductor rotor" (col. 2, line 9), it is not, strictly speaking, a rotor.

Claim 5 stands rejected under 35 U.S.C. § 103 citing GB '808 or Laing '029 in view of Hintz U.S. 4,330,725. However the latter adds nothing to suggest a rotor in torque transmitting connection to a drive shaft.

Claim 3 stands rejected as obvious over GB '808 or Laing '029. The examiner states that these publications disclose a slewing curve which would be obvious to modify to a second-order curve.

This rejection represents a misconception of the teachings of these patents, which have nothing to do with slewing curves and relate strictly to spherical surfaces. The problem of wobble is not addressed or even mentioned; there is no suggestion that any point on the rotor traverses a slewing curve, and therefore there is no suggestion that it could be a second order curve.

The newly added claims recite additional limitations disclosed in the specification and drawings, which limitations define still further over the art of record.

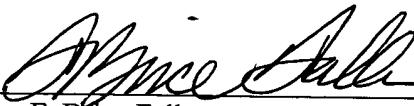
The claims as amended being definite and patentable over the art of record, withdrawal of the rejections and early allowance are solicited. If any objections remain, a call to the undersigned is requested.

It is believed that no fees or charges are required at this time in connection with the present application; however, if any fees or charges are required at this time, they may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,

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AMENDMENTS TO THE CLAIMS SHOWING CHANGES

In the Claims:

Claims 1 and 4 have been amended as follows:

1. (Amended) A drive unit comprising
a housing of an internal combustion engine,
a drive shaft mounted for rotation in said housing, said drive shaft being a
crankshaft,

a stator fixed with respect to said housing, said stator having a surface forming the
boundary of an air gap,

a rotor coaxial to said stator and in torque-transmitting connection with the drive
shaft, said drive shaft causing said rotor to exhibit a wobbling motion which describes a
geometric slewing curve, said rotor having a surface forming a boundary of said air gap opposite
from said surface of said stator, at least one of said surfaces approximating said geometric
slewing curve in a cross section parallel to the drive shaft.

4. (Amended) A drive unit as in claim 1 wherein[, in a cross-section
parallel to said drive shaft,] said surfaces [comprise straight lines which are slewed with respect
to said drive shaft] are conical surfaces, the surface of said rotor being tangent to the slewing
curve.